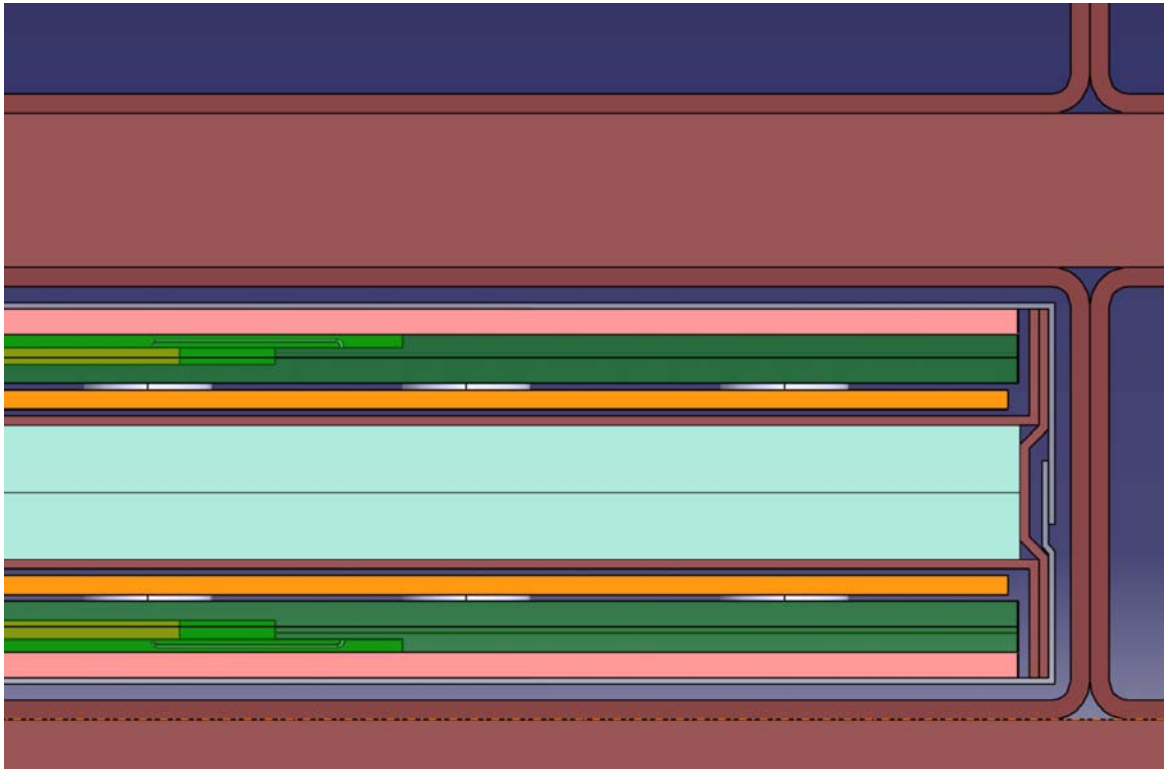
Detector SLAB Integration
EUDET Prototype

- Slab cross section, thickness budget
- Space Frame Ladder {Step I assembly}
- Flip Soft Ladder {A.S.U up side down tilt}
- Main Integration Cradle
- Thermal & Integration Training Mockup

SLAB cross section/ thickness budget



⇨ Outer envelop (housing) : 100 µm
{omega shape clamped to H+W stave}
⇨ Heat shield (Cu) : 400 µm
⇨ Electrical non-conductor foam : 150 µm
{Thermal diffuser & conductor material}

⇨ PCB : 800 µm (tolerances : ± ?)
but chips embedded in PCB ?
⇨ Thickness of glue : <100 µm ?
study of the size of dots
⇨ Thickness of wafer : 320 µm
⇨ Kapton® film HV feeding :
100 µm - OK *(DC coupling)*

⇨ Thickness of W : 2100 µm (± 80 µm)

Space Frame Ladder
A.S.U interconnection & HV feeding

⇨ Std Aluminum structure : free access to A.S.U interconnection, HV feeding & DIF + Terminal boards.

1. HV kapton clamping to the space frame ladder
2. unit-1 A.S.U insertion into the ladder & HV connection *{disconnection process to be studied}*
3. unit-2 A.S.U insertion, into the ladder & HV connection
4. unit-1 to unit-2 interconnection *{kapton bridge technique could answer major specifications}*
5. Electrical qualification & unit-3, unit-4, etc… insertion
6. Full electrical qualification after DIF + Terminal boards integration

Flip Soft Ladder
full sensitive SLAB handling

⇨ Std Aluminum structure : adequate 'soft rubber' edges as direct contact with sensitive SLAB components

1. Mechanical connection of the flip soft ladder to the space frame ladder *{all sensitive parts are 'sandwich' maintained in-between}*
2. Clamping of the sensitive parts to the flip soft ladder
3. Removal of the space frame ladder *{full access to HV kapton feeding}*
4. Sensitive SLAB + soft ladder clamping to integration cradle *{to be operated 'under' the cradle, H+W structure already installed}*
5. 180° up side down tilt of the assembly and soft ladder removal *{HV kapton feeding & sensitive SLAB safely clamped to the cradle}*

Main Integration Cradle

H+W structure, sensitive SLAB & Thermal shielding

⇨ Std Aluminum structure : fully adapted to the H+W structure which is the direct support of sensitive SLAB & thermal shielding

1. Lateral & 'opposite' clamping of the H+W structure to the main cradle *{sensitive slab + soft ladder free access to H+W structure}*
2. After soft ladder removal, summary electrical checking of all sensitive parts *{A.S.U + HV feeding + DIF + terminal boards}*
3. Electrical insulator foam application *{no glue required}*
4. Cupper shielding insertion *{possible thermal grease but no glue required}*
5. Cu full clamping to H+W structure with omega shape housing *{H+W lateral grooves are used to clamp Ω enveloppe}*

Thermal & Integration training Mockup

mechanical handling & thermal measurements

⇨ Heat dissipation 14.4mW/PCB : PCB (100-80 µm), kapton heaters, T°C sensors, data controller, etc…

1. One PCB, 8 kapton heaters, 8 T°C sensors (strain gages) *{thermal setup in progress at LAL-Orsay}*
2. Cupper shielding, electrical insulator foam & Ω shape housing will be added to complete the setup
3. LPSC cooling device & alveolar structure could be integrated to the this thermal setup *{real state confinement at LAL, LPSC or LLR}*